

REMARKS

Claims 1-4, 7 and 8 are pending in the application. Claims 1-3 are rejected. Claims 4, 7 and 8 are allowed.

Claim Rejections - 35 U.S.C. § 103

Claim 1 is rejected under 35 U.S.C. § 103(a) as being unpatentable over David et al (6,018,203), Piesinger (2004/0263147), and Kumegawa (JP 05-126881). This rejection is traversed for at least the following reasons.

As previously explained, the present invention concerns a control system for canceling load unbalance in a three-phase circuit. The invention, as defined in claim 1 and with reference without limitation to the exemplary embodiment in Fig. 1, comprises (1) phase current detectors 73A-73C for detecting phase currents caused to flow through a secondary circuit of a current transformer 71, (2) a zero phase current detector 75, for detecting a zero phase current caused to flow through a residual circuit of the current transformer, (3) phase change over switches 141-1410, (4) a control center 11 for, when a magnitude of the zero phase current detected by the zero phase current detector 75 is larger than a predetermined value, on the basis of the phase currents of the phases detected by the phase current detectors 73, respectively, outputting a control signal, and (5) a phase change-over slave station 131-1310 for controlling the phase change over for the phase change over switches 141-1410 in accordance with the control signal.

Applicants again respectfully submit that certain of the five claimed features, and at least the combination of the five claimed features, are not found in the prior art. Thus, the claims should be considered patentable.

Piesinger

The Examiner now appears to rely on Piesinger as the primary reference and comments that Piesinger teaches a three phase power distribution system providing high voltage and low voltage distribution lines, at paragraph [0002]. In particular, the Examiner points to the distribution network in Fig. 1 and asserts that a current transformer TS (transmission substation 110) and a residual circuit DS (distribution substation 120) and everything down stream in Fig. 1 (Pole/Pad Mount transformers 140; permanent reference phase source 145, manual tester 155

and comparator 165) is pertinent. The Examiner also asserts that Piesinger teaches the importance of load balancing and a method of transferring some of the loads from a more heavily loaded phase to a lightly loaded phase, (i.e., the phase with minimum current), with reference to paragraph [0003]. There Piesinger mentions that load balancing concerns movement of branch circuits from a more heavily loaded phase to a more lightly loaded phase. The object in Piesinger is to observe two widely separated points in the power distribution network in the same instant of time (using GPS for precision) so that the unknown phase of a line under test can be determined. (paragraphs 38-39).

Significantly, the Examiner admits that Piesinger "fails to teach the inner circuitry of DS and how it provides power to subsequent downstream branches." In other words, the protocol and structure used for power balancing is not disclosed or even suggested.

David et al

At page 3 of the Office Action, the Examiner asserts that David teaches the control system for canceling load unbalance of a three phase circuit. The Examiner again identifies in Fig. 1 the phase current detectors (16-20), phase change-over switches (22-30), and a control center (12). The Examiner asserts that the control center 12 inherently has a phase change-over slave station because it controls all of the switches.

Applicant would submit that David et al is fatally defective for two reasons.

First, the Examiner asserts that a phase change-over slave station would be "inherently" included in the control center. The Examiner looks to the disclosure at col. 3, lines 64-67, col. 4, lines 1-10 and Fig. 1a for support for the "inherency" of such structures.

The cited disclosure concerns the operation of control center 12 in acquiring data from current sensors, tracking the load on each phase and on each branch circuit, determining if a percentage is exceeded and setting switches to balance a load. As acknowledged by the Examiner, there is no mention of a slave station. By contrast, the present application illustrates a control center 11 that is attached to ten slave stations T1-T10 via communication lines 12, as explained at page 8 of the specification, the slave stations clearly being external to the control center.

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Applicants again respectfully submit that the slave stations cannot be inherent in the disclosure of David et al on the basis of well established principles of law relating to "inherency". A single prior art reference anticipates a patent claim if it expressly or inherently describes each and every limitation set forth in the patent claim. *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Inherent anticipation requires that the missing descriptive material is "**necessarily present**," not merely probably or possibly present, in the prior art. *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citing *Continental Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991)). The Examiner has made no showing that the phase change over slave station or its function are **necessarily present**, nor can such showing be made since there is no demonstrated need for a "phase change over slave station" in David et al or the recited function. Further, the device 12 in Fig. 1A of David et al is called a "processor" and not a control unit or some broader designation that would suggest additional and external components.

Second, the Examiner admits that David et al fails to explicitly teach either the claimed zero phase current detector (75) or the function of the claimed controller (11), namely "when a magnitude of the zero-phase current is larger than a predetermined value, on the basis of the phase currents of the phases detected by the phase current detectors, respectively, outputting a control signal so that the load of the phase having a maximum current appearing therein is changed over to that phase having a minimum current recognized therein."

Third, Applicant respectfully submits that David et al also fails to teach any structure or function that would demonstrate (1) how the cancellation of the unbalance of the circuit occurs, (2) how any circuit may be incorporated in between high and low voltage distribution lines, and (3) the type of current sensor that may be used. These are fundamental components that go to the basic operation of the claimed invention. At least in the absence of these components, and without any teaching or suggestion that there was a need for them in David et al, the Examiner must resort to hindsight based upon the Applicants' own teachings to seek out and incorporate unrelated elements from other prior art teachings to assert that the invention would be known to one of ordinary skill in the art at the time the application was filed.

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In short, David et al inherently does not have a concern with balance of a three-phase circuit and, as admitted by the Examiner, fails to even teach a concern with zero phase current. Without even the slightest suggestion as to why additional structure is needed, the Examiner looks to Kumegawa to modify David et al.

Kumegawa

In particular, the Examiner looks to Kumegawa for a teaching to fill the significant gaps presented by David et al and Piesinger. The Examiner asserts that Kumegawa teaches detecting zero phase current and comparing it to a threshold value to determine the necessity of phase change over.

The Kumegawa reference is in Japanese and a summary of its teachings may be found in an English language abstract. Applicants have looked to a machine translation of the reference, as found on the JPO website.

First, Applicants note that Kumegawa does not remedy the deficiency of David et al, in that it does not teach that a slave station is needed in a device as disclosed by David et al. Second, Applicants note that a goal of the disclosed device is to prevent an erroneous judgment of a failure by suppressing a residual signal of a zero-phase current signal to be constantly low regardless of changes in parts as they age. The device is not concerned with load balancing. Third, there is no teaching of the claimed function of the controller in claim 1, namely "when a magnitude of the zero-phase current is larger than a predetermined value, on the basis of the phase currents of the phases detected by the phase current detectors, respectively, outputting a control signal so that the load of the phase having a maximum current appearing therein is changed over to that phase having a minimum current recognized therein."

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No Prima Facie Obviousness

The Examiner asserts that it would have been obvious to combine these three references in a manner that clearly is not taught or suggested by any one or more of them, and clearly relies upon hindsight. However, the admitted deficiencies of the references, the improper reliance on inherency for slave stations and the failure of any reference to teach the claimed structure and functions would militate against any prima facie holding of obviousness. The Examiner's position clearly is flawed.

Applicants respectfully submit that there is no teaching or suggestion as to how or why David would be modified in accordance with the disclosure in Kumegawa, as suggested by the Examiner. Indeed, the Examiner has not even mentioned a motivation for modifying David et al on the basis of Kumegawa in his remarks, contrary to the requirements for such express statement in recent Federal Circuit decisions. (See e.g., *In re Lee* 277 F.3d 1338 (Fed. Cir. 2002) and *In re Rouffet* 149 F.3d 1350 (Fed. Cir. 1998)).

It is clear from the Examiner's analysis and the absence of any identified teaching or suggestion for the combination of the three distinct reference teachings that there is no teaching or suggestion as to how or why any one or more of these references may be combined to complete the invention. Further, the clear absence of a zero-phase current detector and phase change-over slave station in David and the absence of any such structure in the prior art would demonstrate the patentability of claim 1. Thus, Applicants respectfully submit that this claim should be allowable over the cited prior art.

Claims 2 and 3 are rejected under 35 U.S.C. § 103(a) as being unpatentable over David et al (6,018,203), Piesinger (2004/0263147), and Kumegawa (JP 05-126881). as applied to claim 1, and further in view of Ellermeyer (3,555,290). This rejection is traversed for at least the following reasons.

The Examiner comments that David, Piesinger and Kumegawa teach a control system as described above. The Examiner admits that David fails to explicitly teach the configuration of the switches with only three inputs. The Examiner looks to Ellermeyer for a teaching of a configuration of the switching unit (10 and 11) with three inputs for the three phases, and a

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single output. The Examiner asserts it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the switch design into David's invention "because he was silent on a precise configuration and this one is known in the art to have worked."

The Examiner also asserts that it would have been obvious to one of ordinary skill in the art at the time of the invention to omit the fourth input to David et al switches (i.e., NC) since the omission of an element and its function in a combination where the remaining elements perform the same functions as before involves only routine skill in the art.

Finally, the Examiner asserts that a "non-connection" configuration would be obvious from the switch in Ellermeyer (11) by controlling it not to make a connection to either input, therefore saving an extra switch/input."

Applicants respectfully submit that Ellermeyer does not remedy the severe deficiencies of David et al alone or in combination with Piesinger and Kumegawa. The reference does not remedy the failure of any of the patents to provide the necessary motivation and teaching for their combination. Ellermeyer is simply cited for the teaching of a switching unit with three inputs and a single output. This alone is insufficient to provide the necessary teaching for combining the four references cited by the Examiner against claim 1.

On the basis of the foregoing, this rejection should be withdrawn.

Allowable Subject Matter

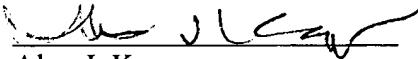
Claims 4, 7 and 8 are allowed. Applicants respectfully submit that on the basis of the foregoing argument, the application with all claims should be passed to issue.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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23373
CUSTOMER NUMBER

Date: October 16, 2006